MEASURING SPATIAL TEMPERATURE NONUNIFORMITY USING SINGLE-BEAM DUAL-COMB ABSORPTION SPECTROSCOPY

NATHAN A MALARICH, *Mechanical Engineering, University of Colorado at Boulder, Boulder, CO, USA*;
GREGORY B RIEKER, *Department of Mechanical Engineering, University of Colorado Boulder, Boulder, CO, USA*.

Absorption spectroscopy typically recovers the average thermodynamic properties along a laser path. However, broadband laser sources, including the dual frequency comb spectrometer, measure many absorption features which provide different temperature information about the path nonuniformity. We have developed a two-step approach to extract a nonuniform temperature distribution from a broadband absorption spectrum spanning hundreds of absorption features. We demonstrate how this approach resolves the path nonuniformity in a tube furnace as predicted by natural convection theory.